

CLAIM

1. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

5 (a1) the hardness of the weld metal is not more than 110% of the hardness of the base metal.

2. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

10 (a2) the hardness of the weld metal is not less than 70% and not more than 110% of the hardness of the base metal.

3. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

(a1) the hardness of the weld metal is not more than 110% of the hardness of the base metal, and

(b) the width of the weld metal is not more than 70% of the plate thickness of the base metal.

20 4. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

(a2) the hardness of the weld metal is not less than 70% and not more than 110% of the hardness of the base metal, and

(b) the width of the weld metal is not more than 70% of the plate thickness of the base metal.

30 5. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

(a1) the hardness of the weld metal is not more than 110% of the hardness of the base metal,

(b) the width of the weld metal is not more than 70% of the plate thickness of the base metal, and

35 (c) the width of the region affected by welding whose hardness is softened to not more than 95% of the hardness of the non-heat-affected base metal has a

width not less than 5 mm.

6. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

5 (a2) the hardness of the weld metal is not less than 70% and not more than 110% of the hardness of the base metal,

(b) the width of the weld metal is not more than 70% of the plate thickness of the base metal, and

10 (c) the width of the region affected by welding whose hardness is softened to not more than 95% of the hardness of the base metal unaffected by heat has a width not less than 5 mm.

7. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

(a1) the hardness of the weld metal is not more than 110% of the hardness of the base metal,

20 (c) the width of the region affected by welding whose hardness is softened to not more than 95% of the hardness of the base metal unaffected by heat has a width not less than 5 mm, and

(d) the prior austenite grain size in the heat-affected zone (HAZ) contacting the welding fusion line is not more than 200 μm .

8. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

30 (a2) the hardness of the weld metal is not less than 70% and not more than 110% of the hardness of the base metal,

(c) the width of the region affected by welding whose hardness is softened to not more than 95% of the hardness of the base metal unaffected by heat has a width not less than 5 mm, and

35 (d) the prior austenite grain size in the heat-affected zone (HAZ) contacting the welding fusion

line is not more than 200 μm .

9. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

5 (a1) the hardness of the weld metal is not more than 110% of the hardness of the base metal,

(b) the width of the weld metal is not more than 70% of the plate thickness of the base metal,

10 (c) the width of the region affected by welding whose hardness is softened to not more than 95% of the hardness of the non-heat-affected base metal has a width not less than 5 mm, and

(d) the prior austenite grain size in the heat-affected zone (HAZ) contacting the welding fusion
15 line is not more than 200 μm .

10. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance, is characterized by:

20 (a2) the hardness of the weld metal is not less than 70% and not more than 110% of the hardness of the base metal,

(b) the width of the weld metal is not more than 70% of the plate thickness of the base metal,

25 (c) the width of the region affected by welding whose hardness is softened to not more than 95% of the hardness of the non-heat-affected base metal has a width not less than 5 mm, and

(d) the prior austenite grain size in the heat-affected zone (HAZ) contacting the welding fusion
30 line is not more than 200 μm .

11. A large-heat-input butt-welded joint of welded structures having excellent brittle fracture resistance according to any one of claims 1 to 10, is characterized by that the welded structures are prepared by butt-
35 welding high-strength steel plates over 50 mm in thickness.